

Minutes of the 4th Aboveground Storage Tank (AST) Enhanced Vapor Recovery (EVR) Workgroup Meeting on July 23, 2002

Meeting Place – Air Resources Board's Monitoring and Laboratory Division in Sacramento, California.

Meeting Presentation – The Air Resources Board (ARB) gave a Powerpoint presentation at the workgroup meeting. This presentation can be viewed on ARB's vapor recovery website at <http://www.arb.ca.gov/vapor/ast/ast.htm>.

April 17th Meeting Highlights

Two main topics discussed at the April 17th meeting were the definition of AST and the AST inventory estimate.

Revised AST Definition

ARB revised the definition of AST to include the recommendation from the Workgroup. There were no comments on the revised AST definition.

AST Inventory Request

On July 12th, ARB sent letters to AST manufacturers to provide statistics of ASTs in California. Preliminary responses from the ARB Inventory Request Letter indicates that ARB's previous estimate of ASTs in California will be low. ARB will have a more accurate number of ASTs in California by the August 20, 2002 AST EVR Workshop.

Status of AST Monitoring Effort

ARB is currently monitoring a 1,000 gallon and 6,000 gallon capacity AST. ARB is monitoring ambient pressure, ambient temperature, tank vapor pressure, and tank vapor temperature. Graphs of the monitoring data were shown. Data on the 1,000 gallon tank showed that vapor integrity was difficult to maintain due to leaking components and loose spill bucket drain valve and 2 inch bung cap (stick port) following a fuel delivery. Data on the 6,000 gallon tank showed that the tank pressures are still positive when fueling a high throughput of onboard refueling vapor recovery (ORVR) type vehicles. In addition, the pressures appear to be correlated with ambient temperatures.

Estimating AST Fugitive Emissions

A method for estimating fugitive emissions from ASTs was discussed. There were no comments on the methodology to estimate fugitive emissions, however, for clarification purposes, the x-axis label on the graph "Example of Fugitive Emissions Estimate Over Time" should be changed from "Time (hours)" to "Hours". There was some confusion

as to whether “Time” referred to the actual time of the day or the number of hours. The x-axis is the number of hours during a day that the AST showed leakages due to positive pressures, i.e., “pressure related fugitive emissions”.

Efficiency Testing / Procedure Development

ARB is planning to conduct testing on AST vapor recovery systems to determine in-use Phase I and II efficiencies. The current Phase I and II emissions estimate, based on 90% vapor control efficiency, is 0.4 tons/day. ARB will use the in-use efficiencies to update the current baseline Phase I and II emissions estimate.

Regarding pressure decay testing of ASTs, a workgroup participant suggested that there needs to be a simpler method of introducing nitrogen into the AST for conducting the annual pressure integrity test. The current test procedure requires the use of a vent pipe pressure assembly for introducing nitrogen. Installing this assembly requires removal of the pressure/vacuum (P/V) vent valve. A simpler approach would be to require a ¼” nipple installed on the vent line. The nipple would be used to connect the nitrogen supply line when pressure decay testing is conducted and would remain capped when not in use.

Open Discussion

- Rupture Disk Emergency Vent – The ARB has met with two rupture disk manufacturers regarding the use of rupture disks as emergency venting devices in gasoline storage tank applications. The manufacturers indicated that the use of rupture disks are very common in the petroleum industry and can be applied to AST systems using gasoline. The workgroup participants had several comments on the use of rupture disks.
 - Workgroup participants were not aware of existing uses of rupture disks on ASTs;
 - Once a disk ruptures, there was concern if it would be replaced promptly;
 - What are the costs?;
 - The disk will need to be protected from physical damage;
 - Emergency vent manufacturers should be contacted to determine if issues or discussions have arisen in the past regarding the use of rupture disks;
 - Although the 2000 Edition of the Uniform Fire Code (UFC) states that rupture disks can be used as alternative emergency venting devices, most local jurisdictions adopted the 97 Edition of the UFC. ARB will review the 97 Edition of the UFC to determine if it allows use of the rupture disks as emergency venting devices.

In summary, the workgroup participants agreed that rupture disks have merit but that further evaluations are necessary. It was suggested that a workgroup subcommittee be formed to evaluate rupture disks.

- Existing Emergency Vents – During ARB’s monitoring and testing of ASTs, it was noticed that some emergency vent lids were difficult to lift from its base. Some force

had to be use to separate the emergency vent lid from its base. O-rings were found to be either dry or coated with different types of lubricant. In most cases, the sealing surfaces were dirty and the bottom side of the cast iron tops were corroded, contributing to further contamination on the sealing surface. One concern is whether the emergency vents, found in the above conditions, would still meet the performance specifications as certified by Underwriters Laboratories (U.L.) or other certifying agency. Questions asked included:

- If the lids on emergency vents are so difficult to move, would the lid open at its design pressures?;
- What are the lubrication requirements on the sealing surface? What type of lubricant shall be used?;
- Are there maintenance manuals for emergency vents and are they approved by U.L. in its certification?

Several Workgroup participants explained that the U.L. certification is a one time proof test, in other words, U.L. performs a test to ensure the emergency vent meets the flow requirements at given pressures. Maintenance and lubrication requirements are not considered in the certification.

- Tank Sticking – Fuel delivery drivers will often “stick” the AST to determine actual fuel levels before filling the AST. Sticking an AST results in fugitive emissions when the AST ullage is under positive pressures. Having a dedicated stick port with a drop tube would reduce fugitive emissions. Workgroup participants stated that some ASTs already have a dedicated stick port with drop tubes and that the drop tubes cost approximately fifty dollars. There was Workgroup consensus that dedicated stick ports with drop tubes is a viable approach.
- Anti-Siphon Devices – There was discussion regarding holes in the top of the drop tubes. Holes in the top of the drop tube act as anti-siphon devices and are used in remote or side-fill applications. These holes may be used in top-fill applications to prevent fuel from blowing out the fill pipe upon fuel hose disconnect. None of the participants were aware of any requirements regarding the size of the anti-siphon holes, the number of holes, or the location of the holes. It was noted that holes sizes vary from 3/8 inch diameter to 1/8 inch diameter.
- Poppeted Fill Adapters – Poppeted fill adapters are typically not used in top-fill applications. Poppeted adapters cost approximately \$400-\$500 dollars each. The mating coupler (fill nozzle) is approximately \$4,700. If holes are allowed in the drop tube and no poppet fill adapter is used, the adapter dust caps would need to be vapor tight and the caps would need to comply with a “no leak” standard.
- Poppeted Fill Adapters w/Close Coupled Shut-Off Valves – To minimize spillage upon Phase I disconnect from side-fill or remote-fill applications, there was discussion on using a poppeted fill adapter with a close coupled shut-off valve. Some workgroup participants explained that at the end of a fuel delivery, the driver

will usually pump the line dry, thereby minimizing any fuel in the line upon disconnect. There would be no reason to have both a poppeted fill adapter and a close coupled shut-off valve if the line is pumped dry. The practice of pumping the line dry may however introduce air into the tank causing vapor growth.

- Operations and Maintenance Manuals – On March 15, 2002, the ARB sent a request to AST vapor recovery component manufacturers requesting an up-to-date copy of their operations and maintenance manuals. Only six manufacturers have responded to date. Operations and maintenance manuals will be required as part of the AST EVR certifications and will need to be approved by ARB prior to certification.

Additional Items

- An AST EVR public workshop is scheduled for August 20, 2002 and will be held at the ARB Monitoring and Laboratory Division located at 1927 13th Street. The workshop announcement and agenda will be posted on ARB's vapor recovery website.
- The ARB is developing a contact list of AST vapor recovery manufacturers. This list will be posted on the webpage.

Proposed Next Workgroup Meeting

The next Workgroup meeting is proposed for late October, 2002.

Presentation and Minutes of Past Workgroup Meetings– Presentations and minutes of previous workgroup meetings can be viewed on ARB's vapor recovery website at <http://www.arb.ca.gov/vapor/ast/archive.htm#minutes>.

Attendees:

Pat Bennett, ARB
Cindy Castronovo, ARB
Joe Guerrero, ARB
LaMar Mitchell, ARB
Paul Thalken, ARB
Marilyn Sarantis, CIOMA
John Ekhtiar, Convault
Rich Erickson, Donlee Pump Company
Paul McWhorter, EcoVault / SPC Corp
Bill Beck, Jensen Precast
John Merrill, Jensen Precast
Tom Busenbark, San Joaquin Valley Unified APCD
James Espiritu, San Joaquin Valley Unified APCD
Gary Reeves, San Joaquin Valley Unified APCD
Lori Williams, Sierra Research
Chris Demarest, Utility Vault / Oldcastle Precast
John Lewis, Utility Vault / Oldcastle Precast

Via Teleconference:

George Lew, ARB
Chris Nagel, Missouri Department of Natural Resources
Bud Pratt, Missouri Department of Natural Resources
John Schroeder, San Joaquin Valley Unified APCD
Brian Aunger, San Luis Obispo County APCD